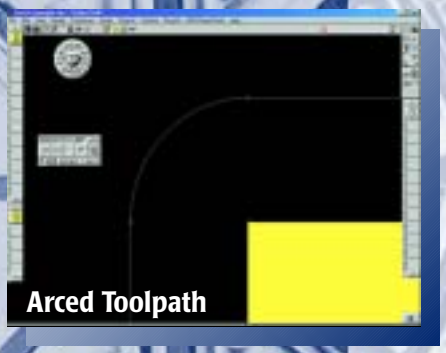
GibbsCAM 2.5D Solids



As more and more design data is being provided from solid model-based CAD applications, the need has grown for a production-ready capability to handle programming parts with 2.5D solid geometry. When added to the base GibbsCAM® system, the GibbsCAM 2.5D Solids option introduces a cost-effective capability that provides a full range of functionality necessary to machine 2.5D solids and generate optimized CNC programs. Using the 2.5D Solids option, CNC programs are created faster, easier, and more efficiently than from geometric shapes only. This option is completely compatible with GibbsCAM Production Milling, Turning, Mill/Turn and MTM™ configurations as well as their post processors.

2.5D solids can be created three ways: directly within GibbsCAM, by solidifying an imported surface model, such as IGES, or by directly reading in a Parasolid, Solid Edge or SolidWorks solid model. In addition, options are available to read ACIS, AutoCAD, Mechanical Desktop, Autodesk Inventor, CATIA V4/V5, STEP AP203/AP214, or Pro/ENGINEER model formats supporting parts from most major CAD systems. Features on the 2.5D solid model can be selected for machining using powerful selection methods that are sensitive to the model's design, allowing floors, walls, fillets or transitions to be isolated. In comparison to other methods, complex selection sets can also be defined more easily and quickly using the GibbsCAM Profiler– an interactive feature recognition (IFR) capability which uses a selection plane dynamically oriented in the solid to create cut shape profiles, or to select the faces associated with cut shape profiles.

Hole-making is a significant aspect of 2.5D machining. The 2.5D Solids option includes a complete system to identify holes using automated feature recognition (AFR) technology and then classify the holes into various hole types along with their parameters. The Hole Wizard, GibbsCAM's knowledge-based manufacturing functionality which generates the tooling and multiple machining processes necessary to create specific instances of hole types, is integrated with AFR through the Hole Manager to automatically machine the identified holes.

GibbsCAM's advanced contour functionality generates superior toolpath that contains lines and arcs rather than the usual segmented polylines. This preserves the part's geometric integrity through to the toolpath ensuring the highest level of part quality. The 2.5D Solids option also includes direct support for turning solid models.

For full 3-axis machining capabilities, the GibbsCAM SolidSurfacer® option can be seamlessly added to the 2.5D Solids option.

Overall System Capabilities

User Interface

- Task Bar
  - Show Solids
  - Render/Wireframe
  - Show Sheet side
  - Face Selection
  - Show Edges
  - Show Profiler
- Body bag (an off-screen location to store inactive solid models)

Geometry

Solids Technology

- Parasolid kernel (V15)
- Direct Import
  - Solid Edge (V14)
  - SolidWorks 2004
- STL Export

CAD Geometry from Solid

- Extract Geometry
- Extract Circles

Surface/Sheet Modeling

- Plane
- Revolve
- Loft (2 parallel plane curves)
- 2.5D Coon's Patch (line/circle)
- Sweep
  - 1 drive curve
  - Drive curve plane aligned along 2D normal
  - Sharp corners
- Sheet Extract
- Trim/Untrim
- Stitch/Unstitch

Solid Modeling

- Create Body
  - Sphere
  - Cuboid (cube)
  - Extrude
  - Revolve
  - Loft 2 curves
  - Sweep
    - 1 drive curve
    - Drive curve plane aligned along 2D normal
    - Sharp corners
  - Solidify
- Slice
- Booleans
  - *Union* (add solids together)
  - *Difference* (subtract a solid from another solid)
  - *Intersect* (creates shape at intersection of two solids)
  - *Separate* (useful for separating an assembly)

Advanced Solid Modeling

- Offset/Shell
- Rounding
  - Simple round
    - Spherical corner option
  - Chamfer
- Body Unstitch

Machining

Hole Manager

- Hole AFR (automated feature recognition)
- Hole Wizard Integration

Profiler

- Cut shape IFR (interactive feature recognition)
  - Profiles
  - Profile faces

General Capabilities

- Solid stock body for mill, turning, mill/turn, MTM
- Z-stock offset setting
- Fixture bodies with avoidance
- Contour Solids*/Surfaces
  - 2D Projection
- Pocket Solids/Surfaces
  - 2D Projection

**Toolpath is optimized to return true line and arc segments (G1, G2, G3 output – eliminating poly-line tool path and creating one block of G-code per feature).*

Designed for Microsoft® Windows® XP Windows® 2000

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